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TECHNICAL

NOTES

LAKE STATES FOREST EXPERIMENT STATION
U.S. DEPARTMENT OF AGRICULTURE · FOREST SERVICE
U. S. DEPARTMENT OF AGRICULTURE

No. 584

Restoring Swamp Conifers on Brushy Lowland Requires Adequate
Brush Control, Large Stock, and Careful Planting

About 2-3/4 million acres of northern Minnesota lowland which once had valuable stands of spruce, tamarack, white-cedar, and balsam fir, are now occupied by worthless alder, willow, and other brush. The natural return of these conifers to such lands is a very slow process as few seed trees remain. To restore these lands to timber will therefore require planting.

Tests indicate that the brush competition on lowland areas can be reduced to a low level and the sites thus prepared for planting with aerial foliage sprays of 2,4-D. However, knowledge of swamp planting is limited. It therefore seems worthwhile to analyze the results of two planting trials on sprayed lowland in northern Minnesota.

One of these trials was put in near Craigville in spring 1953 with tamarack seedlings and with black spruce seedlings and transplants, the other near Loman with black spruce seedlings and transplants in October 1954, May 1955, and October 1955. In both areas, the trees were planted on sprayed and on unsprayed land.

Only the tamarack planted on sprayed land at Craigville shows fair survival and good average height, many of the trees being over 6 feet tall (table 1). In spite of these poor results, some definite conclusions can be drawn.

1. Survival and tree development at Craigville were better on sprayed than unsprayed land largely because tree mortality due to nipping by hares was less in the open areas. At Loman, however, hares came into the edges of the sprayed area from surrounding brush and caused more loss than in the unsprayed area.
2. Black spruce transplants gave much better survival and somewhat better growth than did the seedlings in both areas.
3. Important causes of mortality were hares, drowning, deep planting, and smothering by bluejoint grass. Severe nipping by hares also is responsible for most of the poor average height shown by the black spruce on both areas.

(over)

Table 1.--Survival and height of spruce and tamarack 4 to 7 years after planting

Species	Class of stock	Brush treatment	Average survival (percent)	Average height (feet)	Basis: No. of trees planted
<u>Craigville Area - 7 years after planting</u>					
Black spruce	2-2	Sprayed	31	1.3	200
		Unsprayed	14	.7	50
Black spruce	2-0	Sprayed	12	1.0	200
		Unsprayed	2	.5	50
Tamarack	2-0	Sprayed	43	3.5	100
		Unsprayed	22	1.1	50
<u>Loman Area - 4 and 5 years after planting</u>					
Black spruce	2-2 & 2-1	Sprayed	29	1.2	280
		Unsprayed	60	.8	20
Black spruce	3-0	Sprayed	23	1.0	180
		Unsprayed	35	1.0	20

On the basis of these results, further plantings after the spraying of similarly brushy peat lands should have a reasonable chance of success if the following precautions are taken:

1. Plant tamarack and transplant black spruce stock.
2. Plant on the hummocks avoiding low spots. Low spots may have standing water for long periods which will drown the trees.
3. Plant only when the surface peat is not frozen.
4. Black spruce is shallow rooted; do not plant it too deep.
5. Plant sprayed areas no later than the next spring.
6. Avoid grass areas until chemical or other control measures have been worked out for this important competitor.
7. Because of the possibility of hare nipping along the edges of sprayed areas, leave an unplanted buffer strip about 100 feet wide around all plantings.